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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,027	01/29/2004	Joan Leslie Winnett Bender	CET-026431 CIP	4708
7590	08/30/2007		EXAMINER [REDACTED]	
John S. Beulick Armstrong Teasdale LLP Suite 2600 One Metropolitan St. Louis, MO 63102			VORTMAN, ANATOLY [REDACTED]	
			ART UNIT [REDACTED]	PAPER NUMBER 2835
			MAIL DATE 08/30/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/767,027	BENDER ET AL.
<b>Examiner</b>	<b>Art Unit</b>	
	Anatoly Vortman	2835

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
or Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 06 August 2007.

2a)  This action is **FINAL**.                    2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 1-38 is/are pending in the application.  
4a) Of the above claim(s) 10,11,15-25 and 30-36 is/are withdrawn from consideration.  
5)  Claim(s) \_\_\_\_\_ is/are allowed.  
6)  Claim(s) 1-9,12-14,26-29,37 and 38 is/are rejected.  
7)  Claim(s) \_\_\_\_\_ is/are objected to.  
8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date *See Continuation Sheet.*

4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_ .  
5)  Notice of Informal Patent Application  
6)  Other: \_\_\_\_ .

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date:  
8/31/05,8/7/06,4/26/05,2/24/05,5/3/04.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Group I, Specie I, in the reply filed on 5/15/07 is acknowledged. Applicant states (regarding the assertion that the product can be made by an alternative process): "it is respectfully submitted that a full search of the apparatus claims will encompass methods of manufacture". This is not found to be persuasive. As it was stated in the restriction requirement, the step of the adhesive lamination may be substituted with the steps of riveting, clamping, outer encapsulating, etc. Further, the adhesive was not recited in the apparatus claims. Therefore, contrary to the Applicant's position, the full search of the apparatus claims will not encompass methods of manufacture. Thus, the requirement is still deemed proper and is therefore made FINAL. Further, Applicant's attention is directed to claims 10 and 11, which are not readable on the elected specie, because of the recitation of the "heater element" and of the "heat sink". Therefore, claims will be withdrawn from further consideration along with the remaining non-elected claims. Thus, in view of the above, claims 10, 11, 15-25, and 30-36, are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention and species. There being no allowable generic or linking claim. The Office action on the elected claims 1-9, 12-14, 26-29, and 37-38, follows:

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-9 and 12-14, are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 1 recites, *inter alia*: “a polymer membrane; a fuse element layer formed on said polymer membrane; and first and second intermediate insulation layers extending on opposite sides of said fuse element layer and coupled thereto”. The aforementioned recitation is contradictory. The claim positively sets forth that the fuse element layer is formed on the polymer membrane, and than the claim recites that the first and second intermediate insulation layers extending on opposite sides of said fuse element layer and coupled thereto. It is not clear how said insulation layer may be coupled to the side of the fuse element layer, which has the polymer membrane attached thereto. It appears that said insulation layer should be coupled to the polymer membrane and not to the fuse element layer. For example, Fig. 14 (the only figure depicting the polymer membrane (202)) depicts that the fuse element layer (20) is formed on the polymer membrane (202) and the intermediate insulation layer (24) is coupled to the membrane (202) and not to the fuse element layer (20) as claimed. The specification of the instant application (see paragraph [0098]) also teaches that “[U]nlike the foregoing embodiments wherein the fuse element layer 20 is [...] in direct contact with the upper or lower intermediate insulating layers 22 and 24, the fuse element

layer 20 is supported on a polymer membrane 202. The polymer membrane 202 serves to support the fuse element 20 and provide a surface on which to form the fuse element layer 20". Therefore, in view of the above, the aforementioned claimed structure is impossible to make and use, and therefore, it is not enabled.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claim 37 is rejected under 35 U.S.C. 102(b) as being anticipated by WO 01/69988 to Nishimura et al (of record).

Regarding claim 37, Nishimura disclosed (Fig. 12, 13) a low resistance fuse comprising: a thin foil fuse element layer (6") ; first and second intermediate insulation layers (21b, 21c) extending on opposite sides of said fuse element layer (6") and coupled thereto, said fuse element layer (6") formed on said first intermediate insulation layer (21b) and said second insulation layer (21c) laminated to said fuse element layer (6"), wherein at least one of said first and second intermediate insulation layers (21b, 21c) comprises an opening (71b, 71c) therethrough; first and second outer insulation layers (21a, 21d) laminated to said first and second intermediate insulation layers (21b, 21c), wherein said fuse element layer (6") and said

opening (71b, 71c) are configured to model an adiabatic envelope around a portion of said fuse element layer (6") in a vicinity of said opening (inherently, since the portion of the fusible element layer (6") in the vicinity of the openings (71b, 71c) is completely enclosed by the insulation layers (21a, 21b, 21c, and 21d), said enclosed space constitutes the adiabatic envelope).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura taken alone.

Regarding claim 38, Nishimura disclosed all, but the specific range for thickness of the foil of the fuse element layer (i.e. 1-20 micron). It would have been obvious to a person of ordinary skill in the fuse art at the time the invention was made to provide said foil fuse element taught by Nishimura with any desirable thickness, including within the aforementioned range, in order to provide the fuse with desired current carrying capabilities and to achieve desired breaking characteristics, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. In addition, the thickness of the fuse element is a result

effective variable (the result is current carrying capacity of the fuse and breaking current). It would have been obvious to one having ordinary skill in the fuse art at the time the invention was made to provide said foil fuse element taught by Nishimura with any desirable value of thickness, including within the aforementioned range, in order to provide said fuse with desired current carrying capabilities, since it has been held that discovering the optimum value of the result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272,205 USPQ 215 (CCPA 1980).

8. Claims 26 and 27, are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura in view of US/4,388,603 to Hassler et al., (Hassler).

Regarding claim 26, Hassler disclosed (Fig. 12, 13) a low resistance fuse comprising: a thin foil fuse element layer (6"); first and second intermediate insulation layers (21b, 21c) extending on opposite sides of said fuse element layer (6") and coupled thereto, said fuse element layer (6") formed on said first intermediate insulation layer (21b) and said second insulation layer (21c) laminated to said fuse element layer (6"), wherein at least one of said first and second intermediate insulation layers (21b, 21c) comprises an opening (71c, 71b) therethrough, but did not disclose an arc quenching media located within said opening and surrounding said fuse element layer within said opening.

Hassler disclosed an electrical fuse (Fig. 1) comprising a fusible element (13) surrounded by an arc quenching media (23) to isolate arcing (column 3, lines 27+).

It would have been obvious to a person of ordinary skill in the fuse art at the time of the invention to fill said opening of Nishimura with the arc quenching media as taught by Hassler in

order to isolate and quench arcs, thus preventing the destruction of the fuse and accidental reconnections of the fusible element (via arcs).

Regarding claim 27, Nishimura as modified by Hassler disclosed all, but the specific range for thickness of the foil of the fuse element layer (i.e. 1-20 micron). It would have been obvious to a person of ordinary skill in the fuse art at the time the invention was made to provide said foil fuse element taught by Nishimura as modified by Hassler with any desirable thickness, including within the aforementioned range, in order to provide the fuse with desired current carrying capabilities and to achieve desired breaking characteristics, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. In addition, the thickness of the fuse element is a result effective variable (the result is current carrying capacity of the fuse and breaking current). It would have been obvious to one having ordinary skill in the fuse art at the time the invention was made to provide said foil fuse element taught by Nishimura as modified by Hassler with any desirable value of thickness, including within the aforementioned range, in order to provide said fuse with desired current carrying capabilities, since it has been held that discovering the optimum value of the result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272,205 USPQ 215 (CCPA 1980).

9. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura in view of Hassler as applied to claim 26 above, and further in view of either US/5977860 or US/5699032 to Ulm Jr. et al., (Ulm) (both of record, cited in parent application No. 10/339,114).

Regarding claim 28, Nishimura modified by Hassler disclosed all as applied to claim 26, but did not disclose that said outer and intermediate insulating layers are made from polyimide. Ulm teaches surface mount fuses with layered constructions (Fig. 5), wherein a substrate (4) and an insulating layer (40) are made of polyimide material (see Ulm '032, column 3, lines 45+ and column 5, lines 44+; see Ulm '860, column 3, lines 60+, column 5, lines 61+). Ulm further teaches that polyimide has good thermal insulation properties (see Ulm '032, column 5, P lines 49+; see Ulm '860, column 5, lines 65+, column 6, lines 1+). Since fuses of Ulm and of Nishimura-Hassler combination are from the same field of endeavor (i.e. surface mount fuses having layered construction), the purpose of making insulating layers of fuses from polyimide taught by Ulm would be recognized in the Nishimura-Hassler combination. It would have been obvious to one having ordinary skill in the fuse art at the time the invention was made to select polyimide for making the insulating layers of the fuse of Nishimura-Hassler combination, as taught by Ulm, in order to provide sufficient thermal insulation between layers and to achieve desired current breaking characteristics of the fuse.

10. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura in view of Hassler as applied to claim 26 above, and further in view of US/5,309,625 to Onishi.

Regarding claim 29, Nishimura modified by Hassler disclosed all as applied to claim 26, but did not disclose that said outer and intermediate insulating layers are made from liquid crystal polymer.

Onishi teaches surface mount fuses with layered constructions (Fig. 1, 2), wherein a substrate (1) is made of liquid crystal polymer, because of good heat resisting properties of the

latter (column 2, lines 59-66). Since fuses of Onishi and of Nishimura-Hassler combination are from the same field of endeavor (i.e. surface mount fuses having layered construction), the purpose of making insulating layers of fuses from liquid crystal polymer taught by Onishi would be recognized in the Nishimura-Hassler combination. It would have been obvious to one having ordinary skill in the fuse art at the time the invention was made to select liquid crystal polymer for making the insulating layers of the Nishimura-Hassler combination, as taught by Onishi, in order to provide sufficient thermal insulation and to achieve desired current breaking characteristics of the fuse.

***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure:

US/5153553 and 5712610 teach conventionality of employing liquid crystal polymers for making insulative components of electrical fuses.

Furthermore, Examiner has reviewed all art of record cited in the related applications No. 10/339,114 and 11/065,419.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anatoly Vortman whose telephone number is 571-272-2047. The examiner can normally be reached on Monday-Thursday, between 10:00 am and 8:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Jayprakash Gandhi can be reached on 571-272-3740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anatoly Vortman/  
Primary Examiner  
Art Unit 2835

AV